

# NOTES ON NEOTROPICAL LAURACEAE

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## ABSTRACT

The following notes are based on a study of herbarium specimens of neotropical Lauraceae and are the first results of a long-term project on the American representatives of that family. Unless otherwise stated, all specimens studied are deposited in the herbarium of the Missouri Botanical Garden (MO). When necessary, flowers were softened by boiling for about half an hour. Softening with detergent required much more time (usually about two hours) and this method was discontinued. Lauraceous flowers are trimerous and consist of two (usually equal) whorls of three tepals and four whorls of three stamens, which are numbered from outside to inside with Roman numerals; the anthers of whorl IV, the innermost ones, are reduced to staminodia or lacking.

***Aiouea lundelliana*** Allen, J. Arnold Arbor. 26: 419. 1945. TYPE: Panama. Chiriqui, *White 225* (holotype, MO!).

Allen (1945) cited one flowering collection (the type) and two fruiting collections in her description. Kostermans annotated the type in 1959 as *Aiouea costaricensis* (Mez) Kostermans, a species restricted to Costa Rica and Panama. However, Renner (1982) excluded the species from *Aiouea* and referred it to *Ocotea*. In *Ocotea* it would key to *O. tonduzii* Standley, known from Costa Rica and Panama; indeed, Allen (1945) mentioned in the discussion of *O. tonduzii* that fruiting material is often confused with that of *Aiouea* (which she called *Aniba* by mistake) and that differences are very hard to formulate. *Aiouea lundelliana* and *A. costaricensis* are said to differ in leaf characters: leaves to 16(–18) cm long and 7.5 cm wide with apex obtusely and shortly acuminate and reticulation slightly prominent beneath in *A. lundelliana* and leaves to 12(–13) cm long and 6 cm wide with obtuse or rounded apex (very occasionally shortly acuminate) and reticulation very prominent beneath in *A. costaricensis*. These differences are weak and it is likely that only one species of *Aiouea* occurs in Costa Rica and Panama.

Renner (1982) transferred *A. lundelliana* to *Ocotea* because the type specimen has anthers with four cells, while *Aiouea* has 2-celled anthers. The difference in number of anther cells is the only good character separating *Ocotea* from *Aiouea*; other characters mentioned in literature either do not apply to the Central American *Aiouea* species (*Aiouea* is said to have conspicuous staminodia; in *Ocotea* staminodia are inconspicuous or lacking, but Renner (1982) de-

scribes *A. costaricensis* as having minute staminodia, 0.5 mm long, or without staminodia) or are not sufficient for the separation of genera (leaves often drying yellow-green and with a thickened margin in *Aiouea*; in *Ocotea* leaves dry variously and thickened margin is not a rule). The different generic identifications by Allen and Kostermans on one hand and Renner on the other stimulated me to check the number of anther cells in several flowers of the same specimen in order to verify if that number is constant. As controls, I also checked several flowers from collections identified as *Aiouea costaricensis* and *Ocotea tonduzii*. These species were chosen because of their great resemblance to *A. lundelliana*.

### *Aiouea costaricensis*

*Hartshorn 1121*. Nine flowers checked. Anthers I, II and III all had 2 cells.

*Utley 3040*. Five flowers checked; all anthers had 2 cells.

### *Ocotea tonduzii*

*Poveda 429, 1091* and *Stevens 14131*. Of each collection ten flowers checked. All anthers (I, II, and III) had 4 cells.

### *Aiouea lundelliana*

*White 225*. Eight flowers checked. Anthers I and II were usually 2-celled, but sometimes only 1 cell was developed. Anthers III were 4-celled in two flowers, 2-celled in one flower, and sometimes rudimentary (no cells visible).

*Mori & Kallunki 5680*. Six flowers checked. One flower had anthers I and II 4-celled and III rudimentary; three flowers had I and II 2-celled, III not sufficiently developed for counting, and

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one flower was entirely 2-celled with open anther cells (were closed in other flowers).

*Lao 333*. Two flowers checked. Some anthers were 2-celled, some 4-celled. On the 4-celled anthers the upper two cells were usually much smaller than the lower two.

To exclude the possibility that *Aiouea lundelliana* is represented by pistillate specimens of a dioecious *Ocotea* species with poorly developed anthers, I checked seven flowers of an obvious dioecious *Ocotea* species (*Ocotea cernua* (Nees) Mez, represented by *Brigada Doranthes 3015*, Mexico). This species is not similar to the other three species. In all seven flowers, anthers I and II were 4-celled; in three flowers, anthers III were 4-celled; and in four flowers, they were rudimentary. No 2-celled anthers were seen. Thus, *Aiouea lundelliana* cannot be regarded as a pistillate specimen of a dioecious *Ocotea* species.

The number of anther cells is one of the important characters in the generic classification of Lauraceae. It has always been assumed that this number is constant and I have not found any references to examples of flowers with varying numbers of anther cells on the same whorl (*Endlicheria anomala* Nees ex Meissner is unusual in having anthers I and II 2-celled and anthers III 4-celled, but these numbers are constant: I and II are always 2-celled and III always 4-celled. Similar conditions are also reported for *Phoebe* and *Persea* species). The variation in number of anther cells in *Aiouea lundelliana* stands in strong contrast to the constancy of the number of anther cells in the *Aiouea* and *Ocotea* species and suggests that *Aiouea lundelliana* is a hybrid between an *Aiouea* and *Ocotea* species. This putative hybrid is known only from the Cerro Punta area, Chiriqui province, Panama; the collections were made in 1938, 1971, and 1975. The Mori and Kallunki collection has young fruits, so it is likely that the population on Cerro Punta will persist.

Although infrageneric hybrids in Lauraceae have been reported (Kubitzki, 1982), intergeneric hybridization has, to my knowledge, not been reported earlier. The generic boundaries in neotropical Lauraceae were already considered weak without evidence for intergeneric hybridization and this hybridization makes the need for a reassessment of the genera even more urgent.

*Nectandra kunthiana* (Nees) Kosterm., Meded. Bot. Mus. Herb. Rijks Univ. Utrecht 25: 19.

1936. *Acroclidium kunthianum* Nees, Syst. Laur. 269. 1836. TYPE: French Guyana, *Poiteau s.n.* (P, n.v.). *Ocotea kunthiana* (Nees) Mez, Jahrb. Königl. Bot. Gart. Berlin 5: 291. 1889.

*Ocotea cooperi* Allen, J. Arnold Arbor. 26: 335. 1945. TYPE: Panama. Bocas del Toro, *Cooper & Slater 96* (holotype, F; isotypes, GH, Y, n.v.).

*Nectandra meyeriana* Lasser, Bol. Soc. Venez. Ci. Nat. 11: 184. 1948. TYPE: Venezuela. Aragua: Rancho Grande, *Pittier 15.274* (holotype, VEN, n.v.).

*Pleurothyrium cowanianum* Allen, Mem. New York Bot. Gard. 10(5): 121. 1963. TYPE: Venezuela. Amazonas, *Maguire, Cowan & Wirdack 29830* (holotype, NY, n.v.).

*Nectandra kunthiana*, a wide-ranging species, is characterized by its large, oblong leaves with raised reticulation on both surfaces, rounded leafbases, and brown tomentose pubescence on young twigs, inflorescence, and flowers. It does not fit very well in any of the neotropical lauraceous genera. It differs from typical *Nectandra* in being dioecious and from *Ocotea* in the position of the anther cells (not in two superposed rows, but more or less in an arc). Its generic position can be determined only after the neotropical lauraceous genera are much better defined. Differences cited by Allen (1965) between *Nectandra kunthiana* and *N. meyeriana* (leaves more consistently oblong, sharply reticulate throughout, with presumably a narrow, slightly acute cusp) are insufficient to separate these two species. A character given by Allen (1963) for *Pleurothyrium cowanianum*, leaf margins with dense pubescence, applies only to young leaves and occurs also on Peruvian and Ecuadorian material; older leaves, found on fruiting material, are much less pubescent.

Because *Ocotea cooperi*, *Nectandra meyeriana*, and *Pleurothyrium cowanianum* cannot be separated from *Nectandra kunthiana*, they are here placed in synonymy under the latter species.

*Nectandra kunthiana* is now known from the Guyanas, Venezuela, Peru, Ecuador, Colombia, Panama, and Costa Rica, and I expect it occurs in Brazil as well.

*Nectandra martinicensis* Mez, Mitt. Bot. Vereins Kreis Freiburg 47, 48: 421. 1888. TYPE: Trinidad, *Sieber 99* (lectotype, G, n.v.; isolectotype, MO).

*Nectandra glandulifolia* Lasser, Bol. Técn. Minist. Agric. 3: 16, t. 12. 1942. TYPE: Venezuela. Miranda, *Pittier 8270* (holotype, VEN!). For additional synonymy, see Howard, 1981.

*Nectandra martinicensis* is an inconspicuous, widespread species that has been described three times from Central America (Bernardi, 1967). Characteristic for this species is the combination of membranaceous leaves, densely gland-dotted above, and the whitish pubescence on inflorescence and buds. *Pittier 8270* is in no way different from *N. martinicensis* and therefore *N. glandifolia* is reduced to synonymy under that species. The known distribution of *N. martinicensis* is Mexico, Belize, El Salvador, Nicaragua, Costa Rica, Panama, Colombia, Ecuador (fide Bernardi, 1967), Venezuela (coastal mountains from Zulia to Miranda), Trinidad, Tobago, and Montserrat.

**Ocotea calophylla** Mez, Jahrb. Königl. Bot. Gart. Berlin 5: 298. 1889. *Pleurothyrium velutinum* Meissner in DC., Prodr. 15(1): 170. 1864. TYPE: Colombia. Near Antiquia, *Jervis s.n.* (K, n.v.).

*Ocotea fulvescens* Standley & L. O. Williams, Ceiba 1: 237. 1951. TYPE: Costa Rica. Cordillera de Talamanca, 2,800 m, *Leon 2166* (isotype, MO!).

*Ocotea calophylla* Mez is one of the very few species of *Ocotea* restricted to high montane forests of the Venezuelan and Colombian Andes, usually above 2,500 m. Diagnostic characters are, in addition to its habitat, the sessile leaves with dense, ferruginous pubescence on the lower surface, the recurved base of the leaves, and the two venation lines on the leaves. When Standley and Williams published *Ocotea fulvescens*, they compared it only with other Central American species, from which they considered it distinct because of its dense and persistent pubescence. Because *Ocotea fulvescens* agrees in all characters with *Ocotea calophylla*, it is here placed in synonymy under the latter species.

**Phoebe cinnamomifolia** (Kunth) Nees, Linnaea 21: 488. 1848. *Persea cinnamomifolia* Kunth, Nov. Gen. 2: 160. 1815. TYPE: Colombia, *Humboldt & Bonpland s.n.* (P, n.v.).

*Phoebe mexicana* Meissner in DC., Prodr. 15(1): 31. 1864. SYNTYPES: Mexico. Near Jalapa, *Galeotti 7026* (BR, n.v.); Mirader, *Linden 20* (BR, n.v.).

*Phoebe filamentosa* Allen, Mem. New York Bot. Gard. 15: 69. 1966. TYPE: Venezuela. Merida: along Río Onia, *Steyermark 56740* (holotype, F!; isotype, MO!).

*Phoebe cinnamomifolia* is a wide-ranging, rather variable species, characterized by its al-

most glabrous, tripliveined leaves, lower leaf surfaces pale green due to the densely papillose epidermis, and the erect axillary or terminal inflorescences. Size of the leaves and pubescence of the flowers vary; plants from higher elevation tend to have smaller, more coriaceous leaves and pubescent inflorescences and flowers, whereas material from wet lowland forest (Barro Colorado, Panama; Río Onia, Venezuela) has larger leaves and glabrous inflorescences and flowers. *Phoebe johnstonii* Allen, known only from Panama, was separated by Allen from *P. mexicana* because of its shorter inflorescences (to 15 cm long in *P. mexicana*, usually less than 12 cm in *P. johnstonii*), flowers not white-pubescent, and thinner and narrower leaves. It is doubtful whether it can be maintained as distinct from *P. cinnamomifolia*.

*Phoebe cinnamomifolia* occurs throughout Central America, where it has been named *P. mexicana*, and in Venezuela, Colombia, and Peru.

**Phoebe triplinervis** (Ruíz Lopez & Pavon) Mez, Jahrb. Königl. Bot. Gart. Berlin 5: 211. 1889. *Laurus triplinervis* Ruíz Lopez & Pavon, Fl. Peruv. 4: 30, t. 363. 1957. TYPE: Peru. Cuchero, *Ruíz Lopez, & Pavon s.n.*

*Phoebe pichisensis* A. C. Smith, Bull. Torrey Bot. Club 38: 103. 1931. TYPE: Peru. Junin, *Killip & Smith 25430* (holotype, NY!; isotype, F!).

Macbride (1938) separated *P. pichisensis* from *P. triplinervis* by the leaf venation: pinnate in *P. pichisensis*, and tripliveined in *P. triplinervis*. However, venation on the type material of *P. pichisensis* does not differ from the venation of isotypes of *P. triplinervis* (MO!, F!). Since there are not other differences, *P. pichisensis* is reduced to synonymy under *P. triplinervis*. *Phoebe paraguayensis* Hassler (isotype *Hassler 11305*, F!) is very similar to *P. triplinervis* and may very well prove to be conspecific with it once more material is available.

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